

REMARKS

Applicants respectfully request consideration of the subject application.

This Response is submitted in response to the Office Action mailed August 27, 2007. Claims 16-22 and 24-30 are pending. Claims 16-22 and 24-30 are rejected. Claim 31 has been added. No new matter has been added.

35 U.S.C. § 103 Rejections

The Examiner has rejected claims 16, 17, 19, 20, 22, 24-28 and 30 under 35 U.S.C. § 103(a) as being unpatentable over Matayabas, et al. (U.S. Patent Publication No. 2003/0128521, hereinafter “Matayabas”) and further in view of Pelrine (U.S. Patent No. 6,809,462, hereinafter “Pelrine ‘462”), and Pelrine (U.S. Patent No. 6,707,236, hereinafter “Pelrine ‘236”). The Examiner has rejected claims 18, 21 and 29 under 35 U.S.C. § 103(a) as being unpatentable over Matayabas, Pelrine ‘462 and Pelrine ‘236 and further in view of Takeuchi (U.S. Patent Publication No. 2003/0122242, hereinafter “Takeuchi”).

The Examiner admits Matayabas fails to disclose the first thermal interface material being an electroactive polymer bonded to the heat dissipating device by electrodeposition.

The Examiner submits Pelrine ‘462 and Pelrine ‘236 disclose an electroactive polymer and that one of skill in the art would form the thermal

interface material from an electroactive polymer. The Examiner also submits that the particular method in which the electroactive polymer is applied is related to the manufacturing method and does not further define the structure of the claimed apparatus/system. Applicants disagree.

Matayabas describes an electronic package having thermal interface materials (TIM) that have a gel point of  $G'/G''$  of  $\geq 1$  (i.e., that are a cured gel TIM). Pelrine, on the other hand, describes sensors that comprise a transducer that is in electrical communication with at least two electrodes, the transducer being an electroactive polymer. The transducer is configured such that a portion of the electroactive polymer deflects in response to the change in a parameter being sensed and applying a voltage difference between the two electrodes. The electrical impedance of the transducer resulting from the deflection is then sensed.

One of skill in the art would not combine the electronic package having a thermal interface material of Matayabas with the electroactive polymer sensors of Pelrine. The electroactive polymers of Pelrine are not used as a thermal interface material. In contrast, they are being used to sense electrical impedance. There is nothing to suggest, in Matayabas or either Pelrine reference, that an electroactive polymer can be used as a thermal interface material.

Furthermore, the use of electroactive polymers as a thermal interface material provides advantages not taught or suggested by the prior art. As explained in the present specification, electrodeposition of an electroactive polymer uses the heat dissipating device or IC as an electrical conductor or semiconductor, as described, for example, with reference to Figure 3. Furthermore, electrodeposition also produces physical bonding superior to traditional methods of adhesion, further reducing contact thermal resistance.

Applicants note that MPEP § 2113 provides: "The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product. See, e.g., *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979) (holding "interbonded by interfusion" to limit structure of the claimed composite and noting that terms such as "welded," "intermixed," "ground in place," "press fitted," and "etched" are capable of construction as structural limitations.)"

Thus, the cited art fails to teach or suggest all of the limitations of independent claims 16 and 27. Claims 17-22, 24-26 and 28-30 depend, directly or indirectly, from one of the foregoing independent claims. Applicants,

accordingly, respectfully request withdrawal of the rejections under 35 U.S.C. § 103.

New Claim

As described above, claim 31 has been added. Claim 31 is also patentable over the cited art. The cited art fails to teach or suggest, *inter alia*, as claimed in claim 31 “wherein the first thermal interface material comprises a monomer deposited by electropolymerization.” As described in the present specification, with electropolymeriation of a monomer, the heat dissipating device and/or the IC may be utilized as an electrical conductor or semiconductor, as with electrodeposition. Furthermore, free radical, anionic, or cationic species may be generated to initialize chain polymerization of the monomer, which may result in covalent bonding between the polymer and the surface. Thus, the cited art fails to teach or suggest all of the limitations of independent claim 31.

Applicants respectfully submit that the present application is in condition for allowance. If the Examiner believes a telephone conference would expedite or assist in the allowance of the present application, the Examiner is invited to call Jennifer Hayes at (408) 720-8300.

Please charge any shortages and credit any overages to Deposit Account No. 02-2666. Any necessary extension of time for response not already requested is hereby requested. Please charge any corresponding fee to Deposit Account No. 02-2666.

Respectfully submitted,  
Blakely, Sokoloff, Taylor & Zafman LLP

Date: 11-27-07

Jennifer Hayes  
Reg. No. 50,845

1279 Oakmead Parkway  
Sunnyvale, California 94085-4040  
(408) 720-8300